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OPEN LETTERS.

Relation of moisture to plant diseases.

The object of this note is that of inquiry, especially as to the value of the following opinions and observations:

It is the prevailing opinion that wet weather is favorable to the growth of parasitic fungi, and this is no doubt true in some cases at least. The spring of 1882 was a rainy one in Illinois, and a large number of Peronosporæ were collected. This year a large amount of rain has fallen in New England during July and August, and Uredineæ and Erysipheæ are less abundant than in dryer seasons. In dry autumns like that of 1886 in Central Illinois, fungi of these two groups are exceedingly plentiful. Water plants have few parasites, and plants of wet places less than those growing upon common soil. A. B. SEYMOUR.

Cambridge, Mass.

Bees mutilating flowers.

In the May number of the GAZETTE, in a note on Mertensia, Dr. J. Schneck suggests that the habits of bees to mutilate the corollas of flowers, in order to get at the honey, may be general. Appended are some notes on the subject.

Aquilegia vulgaris L. is mutilated by humblebees. The insects puncture the spur a little above the bulb at the end.

Lonicera parviflora Lam. is punctured just above the calyx.

Weigela (Diervilla, cult. specs.), punctured by humblebees. Honey bees enter the tube.

Orchis spectabilis L. Slits made in lower end of spur.

Aquilegia Canadensis L. Spurs punctured just above bulb.

Mertensia Virginica DC. In May number of BOTANICAL GAZETTE Mr. Schneck mentions Mertensia as being mutilated. A few days after seeing the note I happened to find a patch of that plant and watched the bees at work. They generally punctured the tube, but occasionally a bee would light on the mouth of a tube, insert his head, and then by a sudden movement of the wings cause the honey to drop down upon his head and then suck it up through his proboscis.

Lonicera grata Ait. Reported by Nathan Banks from Roslyn, L. I.

Tropæolum major. Reported by Nathan Banks. "Often 2–5 punctures in the same spur."

Impatiens fulva Nutt. Sometimes the end of the spur is bitten off.

Linaria vulgaris Mill. Slits are made in the spur.

Poughkeepsie, N. Y. GILBERT VAN INGEN.

CURRENT LITERATURE.

Revision of North American Linaceæ. By William Trelease. From Trans. St. Louis Acad Sci., Vol. v., no. 1, pp. 1–20, with 2 plates.

Twenty-one species are described, the two plates representing the fruit of the genus and the petals and filaments of the section Hesperolinon. L. perenne of American botanists becomes *L. Lewisii* Pursh. L. Floridanum is brought to specific rank from a variety of L. Virginianum.

Our species are all clearly endemic with one exception, L. Lewisii. The European forms of L. perenne are heterogone-dimorphic and self-sterile, while the American representative is not heterogone. "It appears, therefore, that forms of a single species, originally distributed over the northern portion of both continents, have in the course of time differentiated so far as to acquire heterogeny in the Old World, or lose it in the New—the latter appearing more probable."

Contributions to American Botany, XIV. By Sereno Watson. From Proc. Am. Acad., xxii., pp. 396-481.

Most of this contribution is given to the enumeration of plants collected by Dr. E. Palmer in Mexico in 1886. It contains the usual percentage of new species that always rewards the labors of the diligent collector in Mexico. This collection was made about Guadalajara, state of Jalisco, as a center, and of all the localities, Tequila, a deep volcanic depression twenty miles northwest of Guadalajara, yielded the most novelties. Of the 675 species enumerated 120 are new, 40 new Polypetalæ by Watson, 45 Gamopetalæ by Gray, 30 Apetalæ and Monocotyledons by Watson, 2 Grasses by Vasey, and 3 Ferns by Eaton. A new genus of Asclepiadaceæ is Mellichampia, dedicated to our well-known southern botanist; Corythea is a new genus of Euphorbiaceæ, and Prochnyanthes a new genus of Agaveæ. In the second part of the contribution are descriptions of 44 new species from various localities, chiefly western· Arabis Drummondii of the Atlantic region all becomes the new species *A. confinis* Watson. True A. Drummondii is confined to the western mountains. In recasting this genus Mr. Watson has found it necessary to propose 6 new species of Arabis, all belonging to the section Turritis, and all western. Podistera is proposed as a new genus of Umbelliferæ, nearly related to Pimpinella, its type being Cymopterus (?) Nevadensis. Peucedanum graveolens of Bot. King's Exp. becomes P. Kingii, owing to prior publication of the former name in the Genera Plantarum. It is also *Seseli Nuttallii* Gray, in large part. *Quercus Sadleriana* R. Brown finds a place among the western oaks, and *Q. Breweri* Eng. is replaced by the earlier name of *Q. Œrstedtiana* R. Brown.

Fresh-water Algæ of the United States (exclusive of the Diatomaceæ), complemental to "Desmids of the United States." By Rev. Francis Wolle. Bethlehem, 1887. Roy. 8°. 2 vol., pp. 364, 151 plates.

This work has been long expected, and meets with a warm welcome. No part of the American flora is so much in need of careful systematic treatment as the algæ. The work of Dr. Wood, long since out of print, was unhandy in form and confessedly incomplete, but has been the only work to do service as a manual up to the present time.

The excellent volume on the "Desmids of the United States," issued some time ago by the same author, has led to the expectation of an equally satisfactory treatment of the remaining non-siliceous fresh-water algæ. In the matter of characterization of species, illustrations, which are abundant and excellent, and general typographical features, the expectation is realized; but in the discussion of imperfectly understood forms and in classification and arrangement, the work is disappointing. The preface, the introduction, and paragraphs here and there through the work, altogether forming many pages, are devoted to elucidating the author's views of polymorphism among algæ, and the consequent unreliability of descriptions of many so-called species as representing specific and stable forms. The theme is evidently a hobby, and so thoroughly permeates the work as to leave an uncomfortable feeling in the mind of the student that there is great and discouraging uncertainty regarding the stability and limits of species among fresh-water algæ, especially of the simpler forms. We regard the discussion as in the main foreign to the purposes of the work and as interfering with its usefulness.

The classification used does not commend itself for either philosophical arrangement or serviceableness. It is not explained; and there is no general key or analytical table to guide the student. A few genera are provided with an outline or key to the species adapted from other writers, notably of Œdogonium and Bulbochæte from Wittrock, Spirogyra from Petit, and Nostoc from Bornet and Thuret.

The volume closes with a good glossary and index, the latter inconveniently divided into two parts, one containing the names used and the other the synonyms.

Aside from imperfections, students will welcome these volumes as giving in connected and handy form the descriptions of our inland algæ, with copious and well drawn illustrations.

Practical Forestry, A treatise on the propagation, planting and cultivation, with a description and the botanical and common names of all the indigenous trees of the United States, both evergreen and deciduous, with notes on a large number of the most valuable exotic species. By Andrew S. Fuller. 12mo., pp. 300. New York: Orange Judd Co.

The above rather elaborate title-page sufficiently describes the scope of this book. The description of the species occupies the larger part (about 200 pages) and should be the most valuable part. But by reason of the faulty arrangement and the uneven descriptions its usefulness will be greatly lessened. The chief value of collected botanical descriptions of the arboreous plants of any region must be to enable one to determine the name of an unknown specimen. It is much more rarely that one knowing the name wants a description. How can the descriptive part of this book help any one while the genera are arranged *alphabetically* and without keys of any kind?

The author is evidently not a botanist, and when he unnecessarily undertakes to discuss synonymy he flounders in the mire of preference and convenience rather than stand upon the sometimes uncomfortable rock of priority. "The novice who desires to find an authority at once unimpeachable and so thoroughly trustworthy that it may in all cases be quoted without fear" is warned that "even in such a simple matter [*sic*] as names of the different species of conifers, authors disagree!" Verily, they do. In the first part of the descriptive chapter the authorities for the names used are not given, though they appear in the index. Synonyms are given only in the index, and there *only below the accepted name.*

A queer set of chapter headings appear in the descriptive part. Thus chapter xv is headed "forest trees;' chapter xvi treats of "evergreen trees," including only Taxus, Torreya, Podocarpus, Dacridium and "Salisbury;" while chapter xvii is entitled "Coniferæ, or cone-bearing trees." What have the conifers done that they must be excluded from the forest trees, and not be allowed to associate with the evergreens?

Of course, the descriptive part is largely a compilation. The first eighty pages, containing chapters on raising trees from seed, budding and grafting, propagating by cutting, pruning, etc., has much useful information, though little that is new. With the author's plea for the preservation of our forests and the systematic establishment of new ones by the state or general government we are in hearty accord, and we sincerely hope that his book may do good in interesting farmers in such work, as it may come to their hands. But we can not get rid of the impression that the book before us was gotten up chiefly *to sell.* We do not therefore feel, as the author avows regarding Henderson's *Evergreens,* that we "can confidentially recommend it."

Vergleichende Anatomie der submersen Gewächse, by Dr. Heinrich Schenck. (Bibliotheca botanica, Heft 1.) Quarto, pp. 67, plates x. Cassel: Theodor Fischer. 1886.

This, the first memoir of a series under the general title "Bibliotheca botanica, Abhandlungen aus dem Gesammtgebiete der Botanik, herausgegeben von Dr. Oscar Uhlworm und Dr. F. H. Haenlein," is in every way worthy to lead the van. A publisher in this country who should undertake to put out such a collection of monographs would be thought mad by his fellows. Botanists are to be congratulated that there is one country and at least one publisher to do such work. Those who know Fischer's work need not be assured that both text and plates are worthy the *imprimatur.*

The memoir before us is a continuation of the author's earlier work, *Die Biologie der Wassergewächse,* and in it he traces the modifications of structure due to the different medium of growth and the consequent functional differences in various organs. The structure of leaves, stems and roots of over thirty species is compared in detail. Many observers have studied submerged plants but no one has ever before brought together the results into a complete comparative study. Some of the generalizations are highly interesting.

The leaves of most submerged plants show a tendency to become slender and hair-like or grass-like, and show little differentiation in the parenchyma, which consists usually of very few layers. The epidermis generally contains chlorophyll bodies and lacks stomata. The vascular bundle is either single or accompanied by two other weakly developed strands. In the stem the vascular system is either reduced, as in Zannichellia, to a single bundle in which only the sieve-cells can be definitely distinguished, or it consists of several well developed bundles coalescent, as in Potamogeton nitens. Between the two extremes there is every gradation. In the bundles one or more lysigenous passages occur which occupy the position of the large vessels, and at the nodes, where the stretching has been too small to destroy them, are fragments of these spiral or annular vessels.

As would be expected, the mechanical elements are but scantily developed. Hairs, crystal and tannin reservoirs are rare, while oil-glands, latex vessels and resin ducts are always wanting. The root system may be entirely suppressed as in Utricularia or fairly developed in more amphibious species.

This series of monographs, by reason of the elaborate work and the elegant illustrations which accompany it, should be in every working laboratory in this country.

Über die Gerbstoff- und Anthocyan-Behälter der Fumariaceen und einiger anderen Pflanzen. By Dr. W. Zopf, Privat-docent, University of Halle. (Bibliotheca botanica, Heft 2.) Quarto, pp. 40, 3 double colored plates. Cassel: Theodor Fischer. 1886.

This is the second paper of the same series. The colored plates are exquisitely done. We can not do better service to our readers than to give a brief abstract of Dr. Zopf's very careful work.

The relation of the Fumariaceæ to the Papaveraceæ suggested to the author that he examine them to discover, if possible, the structures corresponding to the latex vessels of the Poppy family. The analogous cells, which he designates as idioblasts, occur in all organs in the primary parenchyma, and also in those tissues which arise in the secondary thickening of the organs. The primary idioblasts arising from the primary meristem are elongated cells (2–10 mm.) without branches; the secondary, arising in the cambium of the vascular bundles, are at first of the same size as the cambium elements, but afterward elongate. In each at least one nucleus was found, and large quantities of tannic acid, commonly in the form of a clear, homogeneous and highly refractive solution, which may be colorless or dyed by a yellow or red anthocyan. Colorless or yellow idioblasts quickly become red when the organs containing them are exposed to light. Micro- and macro-chemical experiments indicate that the yellow pigment is converted into the red by acids, and it seems probable that the same action occurs in the living plant under the influence of light by the formation of organic acids. The yellow anthocyan appears to develop from a colorless chromogen. These pigments have a definite relation to the tannin; but whether part of the tannin is converted into chromogen or whether the latter is formed new in the presence of the tannin is undetermined.

The plants investigated were Corydalis cava, C. pumila, C. Halleri, C. ochroleuca, C. lutea, Diclytra spectabilis, D. formosa, Adlumia cirrhosa, Fumaria officinalis, F. muralis, Parnassia palustris and Parietaria diffusa.

NOTES AND NEWS.

PROFESSOR C. E. BESSEY made a collecting trip to the Bad Lands and Black Hills of Dakota during vacation.

PROFESSOR L. M. UNDERWOOD, of Syracuse University, is making a two months' collecting trip through the Southern States.

THE FIFTH VOLUME of Saccardo's *Sylloge Fungorum*, devoted to the Agaricineæ, has been issued. It is a thick octavo of 1146 pages, price 72 francs.

DR. A. DE BARY has declined the call to Leipsic as Dr. Schenk's successor, and the professorship has been tendered to Dr. W. Pfeffer, of Tübingen.

DR. GEORG WINTER, editor of *Hedwigia*, and known to many American botanists by correspondence, died at Connewitz, near Leipzig, Germany, August 16, after a long and severe illness.

IN Dr. Farlow's address, printed in the August GAZETTE, an error occurs on page 180, which should be corrected. In the 13th line from the bottom the "not" should be stricken out, which materially alters the sense.

CHARLES S. PLUMB, of the New York Agricultural Experiment Station, and editor of *Agricultural Science*, has accepted the professorship of Agriculture, Botany and Entomology in the University of Tennessee, situated at Knoxville.

THE FIRST FASCIDE of volume 5 of the bulletin of the *Sociedade Broteriana*, bearing date of 1887, is chiefly devoted to a systematic description of the native orchids of Portugal by José d'A. Guimaraes. Thirty-nine species and nine genera are included.

TWELVE NEW SPECIES of North American mosses have recently been described by Dr. Karl Müller (Halle) in *Flora*, No. 14, pp. 219-225. They were collected in Alaska, Colorado, California, Tennessee and Florida. A new species from Labrador is described by Philibert in *Rev. Bryologique*, 1887, p. 55.

BABYHOOD for August has a timely article on poisonous plants, illustrated by accurate wood-cuts. Mothers and nurses are thereby warned against Rhus Toxicodendron, R. venenata, Phytolacca decandra, Conium maculatum, Solanum Dulcamara, Veratrum viride, Datura Stramonium and Hyoscyamus niger. The author should have specified more particularly the poisonous parts of these plants and whether they are poisonous by contact or when eaten.